COOPERATIVE EXTENSION
Washington State University

Agrichemical and Environmental News

A monthly report on pesticides and related environmental issues

Page 1
Agrichemical & Environmental News
Dec. 1999
No. 164

In This Issue

Comments to: Catherine Daniels
WSU Pesticide Information Center
2710 University Drive
Richland, WA 99352-1671
Phone: 509-372-7495
Fax: 509-372-7491
E-mail: cdaniels@tricity.wsu.edu

The newsletter is on-line at www2.tricity.wsu.edu/aenews, or via the Pesticide Information Center (PICOL) Web page at http://picol.cahe.wsu.edu

Hard-copy subscriptions are $15 a year. Mail check to above address, ATTN: Sally O'Neal Coates, Editor.

The Chlorpyrifos Risk Assessment

Part 1: A Tale of Two Sciences

Dr. Allan S. Felsot, Environmental Toxicologist, WSU

As mirrors reflect an obverse reality, popular accounts of EPA's recently released risk assessment for chlorpyrifos seemed to be objective but somehow wrong. An Associated Press release contended that chlorpyrifos was so pervasive that "a majority of Americans, including children, face potential health risks." As if pervasiveness was somehow synonymous with hazard. The *Washington Post* on-line declared boldly, "EPA Says Dursban May Harm Health." The *Post* went on to say that exposure to Dursban on the skin, in food, or by inhalation could be harmful to human health. And of course, the Environmental Working Group (EWG) always enters the fray with its press release *de résistance*, subtitling it "Children Found Especially Vulnerable" as it demanded chlorpyrifos be banned. Echoing the *Washington Post* (or was it the other way around?), EWG stated that chlorpyrifos "poses excessive safety risks to millions of Americans each year who are exposed when they use the chemical to kill bugs in their homes or gardens, or consume food contaminated with the compound."

OK, let's clear the air right away. I've read quite a bit of the released draft chapters of the Re-Registration Eligibility Decision Documents (REDs) in dreaded detail, and I can categorically state that the popular accounts are more reflections of wishful perspective than faithful reportage of the documents. The most egregious misinterpretation is that EPA concluded excessive risk from eating chlorpyrifos residues in food (a.k.a. dietary risk). In fact, EPA said that levels of both acute and chronic exposure were not of concern. As a matter of fact, chlorpyrifos breezed through the most rigorous of dietary exposure assessments, and passed with flying colors despite being saddled with a 300-fold safety factor.

So what is all the hoopla about? If anything, chlorpyrifos has acquired the honor among pesticides of being the first one deemed "too risky" by virtue of residential exposure. In short, it's okay to eat it, but don't use it around the house. But the conclusion is just the beginning of our tale. The real story is about whose science is more sound.

Risk Assessment for Dummies

Before delving further into our tale, let's level the playing field with a quick primer on what is in the RED.

...continued on next page

Chlorpyrifos, cont.

Dr. Allan S. Felsot, Environmental Toxicologist, WSU

The RED consists of chapters cobbled together by EPA's Health Effects Division (HED). Within those chapters, the basic elements of a risk assessment—hazard identification, dose-response relationships, exposure assessments, and risk characterization—can be found. All human health hazards from weight loss to enzyme changes to death are considered. EPA scours the pile of submitted manufacturer's data to find the most sensitive hazard, i.e., the one occurring at the lowest dose tested. Once this hazard is identified, then EPA decides which dose causes no effect (the NOEL) in the most sensitive animal tested, usually rats or dogs. Possible exposure scenarios are derived generally by any combination of three methods: (1) directly from situation-specific studies by the pesticide manufacturer; (2) indirectly from previously compiled databases of other worker exposure studies; or (3) calculated from one of several mathematical models simulating pesticide residue behavior in surface and ground water.

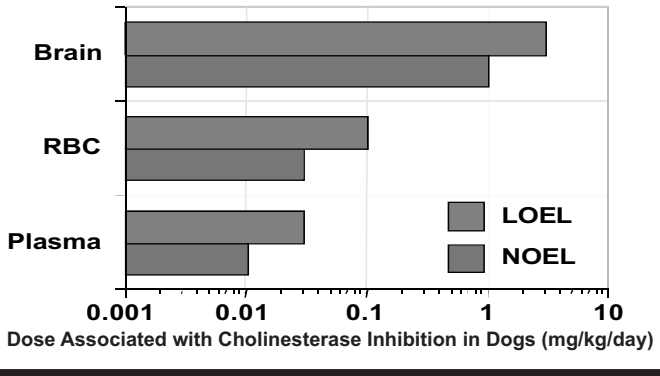
The estimated exposure is compared to EPA's predetermined level of concern, the Reference Dose (RfD). The RfD is calculated by dividing the NOEL by some uncertainty factor (usually 100), and then adjusting the result to account for exposure of children, if they are deemed more sensitive than adults. The final safe exposure, known as the Population Adjusted Dose (PAD), represents the maximum milligrams of pesticide exposure per kilogram of body weight per day (mg/kg/day) that EPA judges will cause no unreasonable adverse health effect of any kind in any age group. PAD is calculated for both single-day (acute) exposure and 70-year lifetime (chronic) exposure.

Cholinesterase Inhibition: Which One Is the Best for Hazard ID?

Applying these principles to chlorpyrifos, EPA concluded that all of Dow AgroSciences (DAS) submitted data pointed to inhibition of cholinesterase enzyme as the most sensitive toxicological endpoint upon which to base the RfD. However, cholinesterase, which helps modulate nerve activity, comes in many forms and occurs in many tissues. Inhibition of the form known as acetylcholinesterase (AChE) in rat and dog brains is without doubt related to its toxic effects. But an alternative form known as pseudo- or butyrylcholinesterase (BChE) is inhibited in the plasma without any toxic effects. EPA says BChE inhibition matters. DAS says it is irrelevant and only indicates exposure. Inhibition of true acetylcholinesterase in red blood cells (RBCs) is the best predictor of toxic effects stemming from inhibition of brain AChE.

The science argument between EPA and DAS may sound like a barroom discussion about how many angels can dance on the head of a pin, but recall that the level of acceptable risk is basically decided when the NOEL of the most sensitive hazard is identified. The effect of choosing this endpoint is aptly illustrated by a comparison of the NOEL and LOEL (Lowest Observed Effect Level) observed after feeding dogs for two years with different doses of chlorpyrifos (Figure 1.)

FIGURE 1



The dose at which cholinesterase inhibition occurs varies with the type of tissue tested.

If inhibition of RBC AChE rather than plasma BChE is chosen as the most important hazard to use as a benchmark for risk characterization, then DAS can fit three times more exposure into the metaphorical exposure risk cup. Needless to say, EPA's viewpoint prevailed.

The Infant Factor and Hazard ID

Concerning other hazards, both EPA and DAS agreed that chlorpyrifos does not cause gene mutation, chromosomal breakage, or cancer. EPA agreed with DAS that the tests used to determine whether children are more sensitive than adults indicated there is no difference in sensitivity. Nevertheless, EPA thought that published scientific literature suggested some increased sensitivity in infants, and therefore decided to apply an extra threefold safety factor to the RfD to produce the PAD.

...continued on next page

Chlorpyrifos, cont.

Dr. Allan S. Felsot, Environmental Toxicologist, WSU

DAS vehemently dissented, supplying plenty of reasons. The argument is worthy of its own essay (stay tuned for Part 2).

Cherry Picking the Dose-Response Relationship

Chlorpyrifos is one of the few pesticides that has been studied under controlled conditions in human volunteers. DAS argued that the dose-response information from its three separate human studies provided valid, reliable data for the NOEL. EPA had accepted the DAS human data until 1998. But during early 1999, the agency decided the studies were not adequate to support the toxicity endpoints (i.e., the NOEL). Instead EPA reevaluated the rat and dog dose-response toxicity studies and decided that an acute single dose rat study sufficed for an acute NOEL of 0.5 mg/kg. The chronic NOEL of 0.03 mg/kg/day was derived from a two-year dog-feeding study.

The switch from the use of human data to rat and dog data obligated EPA to divide the NOELs by a safety factor of 100-fold to derive RfDs for acute and chronic exposure of 0.005 and 0.0003 mg/kg, respectively. When only animal toxicity data are available, the safety factor of 100 accounts for a hypothetical tenfold potential difference in sensitivity between rats/dogs and humans and an additional tenfold factor for differences in susceptibility among humans.

EPA justified its fall back on animal data with two main reasons. First, the agency argued that humans were more sensitive to cholinesterase inhibition than either rats or dogs. But DAS pointed out that EPA failed to recognize they were comparing inhibition of the more sensitive BChE that predominates in dog and human plasma with the less sensitive AChE that is most prevalent in rat plasma. In fact, when inhibition of the same form of cholinesterase was considered, humans were no more sensitive than other animals, perhaps even less so. As evidence, DAS agreed with the EPA that the acute NOEL should be 0.5 mg/kg/day, but their support came from two of their human studies.

EPA's second concern about human studies was that the one earmarked for supporting a chronic RfD used only four humans per dose group in a relatively short-term test of twenty-eight days. Ironically, two dog studies that EPA relied upon only used three or four dogs per dose group. Although the studies lasted one or two years, inhibition of cholinesterase was observed after only seven days, proving that both short and long periods of exposure gave the same magnitude of effect.

The worldwide regulatory community, as represented by the World Health Organization (WHO) in addition to the European Union and Canada, has long accepted the practice of applying only a tenfold factor to the NOEL when human testing data were available. Not only did DAS argue for consideration of the human data, but the company also held fast to scientific opinion that plasma BChE inhibition was not a toxic endpoint, only a measure of exposure. DAS wanted the RfDs to be based on inhibition of RBC AChE, making them 0.05 and 0.01 mg/kg/day for acute and chronic exposure, respectively.

It's Everywhere, It's Everywhere! Real World Exposure Assessment

Now comes the last piece of the puzzle before risk can be characterized. How much exposure do consumers, workers, and residents suffer? EPA used a combination of empirical exposure studies submitted by DAS, data from the Pesticide Handler Exposure Database (PHED), and assumptions from draft residential Standard Operating Procedures (SOPs) to estimate exposures for commercial and private applicators, residential (homeowner) applicators, and residents post-application.

Professional applicators were assumed to wear long-sleeved shirts, long pants, nitrile gloves, and chemical-resistant boots. In contrast, EPA assumed residential applicators were only wearing shorts, short-sleeved shirts, and no gloves. Thus, exposure for homeowners was assumed to be worst-case, not what is prudent or recommended.

Risk Characterization: Rigged to Fail?

The last step of risk assessment involves overlaying the acceptable exposure benchmarks (in this case, the RfD or PAD) on the estimated exposures. For determining applicator and residential risk, EPA uses a margin of exposure (MOE) method in which estimated exposures are compared to the acute or chronic NOELs. But the

...continued on next page

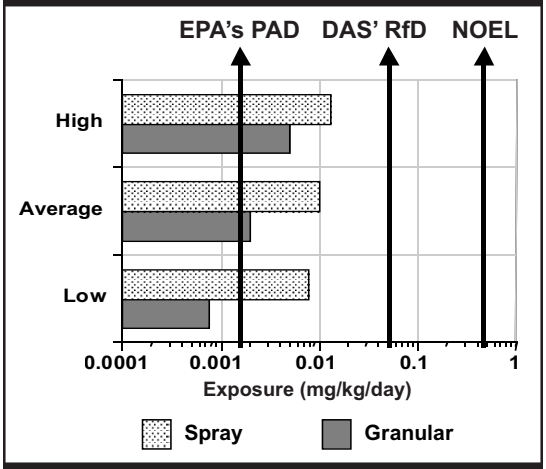
Chlorpyrifos, cont.

Dr. Allan S. Felsot, Environmental Toxicologist, WSU

method turns out to be the same as if exposure was expressed as a percentage of the RfD or PAD. Any exposure less than the RfD or PAD are considered below levels of concern.

The calculated risk is highly dependent on the choice of benchmark: RfD or PAD. The effect of this choice is aptly illustrated by comparing two residential exposure scenarios to these benchmarks. In Figure 2, I graphed measured exposures reported by DAS for broadcast lawn treatments, one with a chlorpyrifos spray and one with a granular formulation. Low, average, and high exposure characterizations are shown for each of the two formulations. I then overlaid the EPA acute PAD (0.0017 mg/kg/day), which incorporates a 300-fold safety factor, and the acute RfD (0.05 mg/kg/day) that DAS has submitted and extensively supported with published scientific papers.

FIGURE 2



Risk characterization of residential exposure following lawn treatment with chlorpyrifos spray or granular formulation. Exposures are categorized as low, average, or high based on actual DAS measurements.

Because the exposure bars crossed the line indicating the EPA PAD, the risk was characterized as exceeding the levels of concern. EPA found many such incidences of worker and residential exposure that were unacceptable. However, from the DAS viewpoint, EPA's calculated exposures were well under the RfD. Furthermore, DAS submitted revised calculations for exposure that were much lower than EPA's estimates.

To gain a perspective of how safe the estimates of exposure are compared to actual observations of no effects, a line representing the mutually agreeable acute NOEL (0.5 mg/kg/day) based on both rat and human studies was drawn across the graph.

Whose Risk Is It Anyway?

One really can't fault EPA for setting conservative standards for acceptable risk. After all, the agency is under tremendous political pressure to "do the right thing." But that doesn't make their interpretation of "the right thing" sound science. DAS submitted to EPA a one-inch thick document of rebuttal, citing a number of independent analyses that run counter to the agency's views and analyses.

Regardless of whose science is more sound, I see a philosophical argument here. If we were talking about dietary exposures, perhaps EPA might have some ground to be so conservative because the risk would be essentially involuntary and unavoidable.

But worker and residential exposures are voluntary risks. Workers are free to choose their employer, but more importantly, they are trained to handle the pesticides and are fully informed of the consequences when they are sloppy. Residents choose to purchase a product to use around the home, but they are also free to question a hired professional pest control service about the products they use and to demand products they feel would be the least hazardous. The principle of caveat emptor has long been used for the voluntary purchase of pharmaceutical chemicals over the counter. Perhaps the principle should be applied to residential use of pesticides. Considering the wealth of information available for chlorpyrifos, the existence of human testing data, and plenty of scientific dissent, EPA's concerns about risk may have exceeded reasonable levels.

Dr. Allan S. Felsot is an Environmental Toxicologist with the Food and Environmental Quality Laboratory at Washington State University. He can be reached at ***afelsot@tricity.wsu.edu*** *or (509) 372-7365.*

REFERENCES: All references used to prepare this article are contained in documents downloaded from the EPA's OP insecticide website for chlorpyrifos, (**http://www.epa.gov/pesticides/op/chlorpyrifos.htm**).

Making the Connection

Farmers and the General Public

Page 5
Agrichemical & Environmental News
Dec. 1999
No. 164

Dyvon Havens, WSU/Skagit County Horticulture Extension Agent

Agriculture contributes to the quality of life throughout the state of Washington and the nation. But evidence suggests that while there is widespread appreciation of open space, greenbelts, wildlife, and recreation, the non-farm community does not connect these assets with the presence of farms. In a 1996 study, seventy percent of the respondents said the quality of life in Skagit County is very important. Sixty-six percent considered open space very important. Fifty-seven percent said protecting wildlife habitat was very important. Yet only thirty-six percent viewed agriculture as very important. For whatever reason, people are not making the connection between farming and the quality of life, open spaces, and wildlife habitat they enjoy.

Outreach programs in Skagit County educate the public about farming.

With less than two percent of the U.S. population involved in farming, few people have direct experience in agriculture. U.S. citizens enjoy the low cost of food, yet they frequently lose sight of the link between the farm and the freezer case in the local grocery store. Town and city dwellers sometimes seek out a rural atmosphere for their homes, yet they express concern about pesticide use, noise, dust, odors, and insects. They may even support increased regulation of farmers, due to lack of understanding of the realities and complexities of farming.

One effort to address the need for increased opportunities to link agriculture and consumers was launched by Washington State University (WSU)/Skagit County Cooperative Extension in 1998. The project, *Sharing the Skagit: People, Agriculture, & Wildlife*, is funded by part of a $113,000 grant from United States Department of Agriculture (USDA) Sustainable Agriculture Research and Education program. Its purpose is to increase community knowledge of agriculture and the economic and aesthetic benefits it provides. The goal is to increase the long-term sustainability of the wider community, its landscape attributes, and its economic and agricultural bases. Skagit County is a prime area for such a project. Located within an hour's drive of the major metropolitan city of Seattle, the county is under extreme pressure for the conversion of farmland to other uses, primarily housing. Between 1960 and 1997, the population of Skagit County increased by 89%. In that same time frame, 34% of the county's farmland was lost to other uses. The population is expected to grow another 50% by the year 2020.

Skagit County has deep roots in its agricultural heritage, but many newer residents do not share those roots and the accompanying values. A major thrust of *Sharing the Skagit* has been to reach these newcomers through programs that appeal to the wider audience of consumers in general. This article describes two such programs: 1) the Skagit Agricultural Speakers Bureau and 2) Celebrating Skagit Agriculture: A Festival of Family Farms.

Agricultural Speakers Bureau

The idea for an agricultural speakers bureau started around a breakfast table in the tiny town of LaConner, which sits on the western edge of thousands of acres of agricultural land in Skagit County. I called together a diverse group of about a dozen people, including a county commissioner, the director of a farmland preservation organization, the director of the local economic development association, the manager of a leading agrichemical dealership, the conservation chair of the local Audubon society, local farmers, and WSU faculty and staff. Discussion focused on ways WSU Extension might provide leadership for linking the farming and non-farming communities. Over the course of the next year and a half, we prioritized projects and the WSU members of the team wrote and submitted a grant proposal. An agricultural speakers bureau was one of the projects supported in the grant award.

Volunteers were solicited through extension newsletters, personal contacts and letters, and announcements at community events to serve on a speakers

...continued on next page

Making the Connection, cont.

Dyvon Havens, WSU/Skagit County Horticulture Extension Agent

bureau advisory committee ("core team"). In the fall of 1998, we held a kick-off event to explain and promote the larger *Sharing the Skagit* project and to invite participation. Press packets were provided to the media prior to the event. Three hundred members of the community were invited to the event and seventy attended, each of whom received a colorful packet of information and a sign-up card on which to indicate the aspects of the project in which they were interested in committing time.

The core team organized and managed the structure of the speakers bureau. They developed vision and mission statements, as well as a plan for implementing the program. A major outreach effort yielded a total of seventy residents who indicated an interest in being members of the larger agricultural speakers bureau. Our orientation session included a welcoming ice-breaker exercise, a demonstration speech and evaluation, and presentations on such topics as expectations of speakers bureau members; purpose and meaning of the vision and mission; operating structure and function of the speakers bureau; and an overview of the speaker training sessions to be held later in the month. In late spring of 1999, speakers bureau members participated in six hours of speaker training, conducted by a professional speech educator and coach. Fifty-four people, including livestock farmers, crop farmers, dairy farmers, shellfish farmers, forest managers, bankers, Realtors, FFA students and teachers, university researchers, farmland preservationists, and environmentalists completed the program and are now trained members of the Skagit Agricultural Speakers Bureau. The core team members and I developed a scripted speech with slides on Skagit Valley agriculture. The speech is available to any member who wishes to use it. A list of a wide range of other speech topics related to agriculture is available to the public.

To date, speakers bureau members have delivered more than twenty presentations, reaching more than 300 individuals. A promotional postcard was widely distributed during the annual Tulip Festival in April, which brings about one million visitors to Skagit County. One of the future goals of the program is to reach a large percentage of these visitors with educational information. We plan to promote the program throughout western Washington.

Celebrating Skagit Harvest: A Festival of Family Farms

This community education project was in part an outgrowth of *Sharing the Skagit,* although it was separately funded through donations from local businesses. It was modeled after a similar event conducted through the Clallam County Cooperative Extension.

On October 2, 1999, ten Skagit County farms opened their gates to the public for farm tours, food, children's activities, educational displays and videos, music, and other activities. The goals of the event were to increase public understanding of agriculture and to improve good will between the farming and non-farming communities. Celebrating Skagit Harvest offered consumers an opportunity to meet farmers, experience first-hand what it feels like to be on a real working farm, and re-connect with the source of their food and fiber.

As WSU/Skagit County Extension Agent, I led a team of twenty-two volunteers in organizing and implementing the event. Community businesses, organizations, and Skagit County government contributed over $10,000 in cash and in-kind goods and services to help make the event a success. Skagit County commissioners proclaimed the first Saturday in October as "Celebrating Skagit Harvest Day." The local daily newspaper contributed toward sponsorship of a four-page, full-color newspaper insert promoting the event to 21,000 households. Elementary school children carried home 7,000 promotional flyers. Approximately 4,000 people were counted at the ten farm entrances on October 2. Many people visited from two to four farms during the day.

Farm open houses were held in seven other counties in western Washington on the same day through a coordinated effort by WSU extension faculty and members of the Cascade Harvest Coalition.

It is important to educate the general public about their connection to farms and farmers. If you are interested in starting outreach programs similar to ours in Skagit County, please feel free to contact me.

Dyvon Havens is a County Extension Agent with WSU/Skagit County Cooperative Extension. She can be reached at (360) 428-4270 or ***dyvon@co.skagit.wa.us****.*

Pesticide Applicator Training Courses for 2000

Washington State University offers PRE-LICENSE courses (for those who do not have a license and need one) and RECERTIFICATION courses (for those who need to renew their current licenses). Fees are $35 per day if postmarked 14 days before the program, otherwise $50 per day. This fee DOES NOT include WSDA license test fees, which range from $25 to $170; for information on testing and fees, contact WSDA at (360) 902-2020 or **http://www.wa.gov/agr/test/pmd/licensing/index.htm**. Recertification courses offer 6 credits per day. FOR MORE INFORMATION or REGISTRATION: (509) 335-2830, **pest@cahe.wsu.edu** or **http://pep.wsu.edu**.

Recertification Courses		Pre-License Courses	
Eastern Washington	**Western Washington**	**Eastern Washington**	**Western Washington**
Pasco, Doubletree Inn Jan 12 & 13	Vancouver, WSU Campus Jan 5 & 6	Pasco, Doubletree Inn Jan 11, 12, 13	Vancouver, WSU Campus Jan 4, 5, 6
Yakima, Convention Center Jan 20 & 21	Tacoma South Park Community Center Jan 12 & 13	Yakima, Convention Center Jan 19, 20, 21	Tacoma South Park Community Center Jan 11, 12, 13
Pullman Moscow (ID) University Inn Jan 25 & 26	Lynnwood Edmonds Community College Jan 20 & 21	Pullman Moscow (ID) University Inn Jan 24, 25, 26	Lacey Lacey Community Center Jan 31, Feb 1, 2
Moses Lake, Elks Club Jan 27 & 28	Port Orchard Givens Community Center Jan 26 & 27	Wenatchee, Doubletree Inn Jan 31, Feb 1, 2	Mount Vernon, Cottontree Inn Feb 8, 9, 10
Wenatchee, Doubletree Inn Feb 1 & 2	Lacey, St. Martins College Jan 31 & Feb 1	Spokane Spokane Valley Doubletree Inn Feb 15, 16, 17	Kirkland Lake Wash. Technical College Feb 15, 16, 17
Spokane Agricultural Spokane Valley Doubletree Inn Feb 14	Highline Community College Feb 3 & 4	Spokane Agricultural Private Applicator License Spokane Valley Doubletree Inn Mar 25	Tacoma Pacific Lutheran University Feb 29, Mar 1, 2
Spokane Spokane Valley Doubletree Inn Feb 16 & 17	Mount Vernon, Cottontree Inn Feb 9 & 10		Tacoma Aquatics Pacific Lutheran University Mar 1
DEALER MANAGER RECERTIFICATION COURSE **—EASTERN WA—** Colfax Community Education & Training Center Jan 14 Moses Lake Elks Club Jan 18 **—WESTERN WA—** Puyallup WSU Feb 15	Kirkland Lake Wash. Technical College Feb 16 & 17	**INTEGRATED PLANT HEALTH MANAGEMENT** Puyallup, Jan 25-27 3 days, 15 credits, $150	Puyallup, WSU Campus Mar 28, 29, 30
	Tacoma Pacific Lutheran University Mar 1 & 2		Puyallup, WSU Campus Apr 4, 11, 18, 25 (Special 4-day course)
	Seattle University of Washington Mar 16 & 17		

Page 8
Agrichemical & Environmental News
Dec. 1999
No. 164

"Endangered Species" Theme Packs 'Em In at 4th Annual Pesticide Issues Conference

Sally O'Neal Coates, *Agrichemical & Environmental News* Editor

The conference room of the Yakima, Washington, Doubletree Hotel was filled to capacity for the fourth annual Pacific Northwest Pesticide Issues Conference. The event, held October 19, 1999, drew participants from around the state (and beyond) to hear policy makers, research scientists, and industry representatives discuss the topic "Threatened and Endangered Species: Pesticide Science, Issues, and Policy." The conference was sponsored by Washington State University (WSU) Cooperative Extension.

The October event was well attended and jam-packed with information.

Getting Our Bearings

Event Chair Carol Ramsay, WSU Pesticide Education Coordinator, opened the conference promptly at 8:00 a.m., with meeting logistics and credits. Her superb organization and subtle gestures kept the day's speakers on track and ensured the jam-packed agenda moved along smoothly and stayed on schedule. Perhaps we can get Carol a big gong for next year, or one of those long, shepherd's-crook-style "hooks" to enhance her already fine facilitation skills.

Dr. Allan Felsot, Environmental Toxicologist with WSU's Food and Environmental Quality Program, began the presentations with a spate of definitions designed to help attendees get up to speed with the lingo of the day. In a fast-paced fifteen-minute presentation entitled "Refresher Course: Numbers and Alphabet Soup," Dr. Felsot outlined the Endangered Species Acts (federal and state), risk assessment vs. risk management (the former is scientific, the latter more socio-political), pesticide residue detection (reminding us about detection methods and limits, and that detection does not equal hazard), and risk guidelines (what is tolerable and why).

Water and What's In It

This was followed by an update on "Eastern and Western Washington Water Quality," presented by James Ebbert of the United States Geological Survey (USGS) Water Resources Division. Ebbert spoke about the various USGS National Water-Quality Assessments (NAWQAs) being conducted in Washington, detailing aspects of the Central Columbia Basin, Puget Sound Basin, and the just-begun Yakima River Basin projects. He explained that NAWQAs look at issues beyond, but including, pesticides. Nationwide, urban areas frequently show pesticide levels exceeding aquatic life standards; our Puget Sound Basin is no exception.

Dr. Matt Kadlec continued the examination of water quality in urban (west-of-the-Cascades) streams, from a Washington State Department of Ecology perspective. Puget Sound Basin is almost three-quarters forested, with only eleven percent classified as "urban," yet fifty percent of pesticide use occurs in the urban areas. Species formerly present in urban streams have disappeared or the population numbers have declined. Other factors may be responsible, but pesticide residues may play a role. Department of Ecology measured levels of 100 pesticides in ten Puget Sound Basin creeks at high and low flow periods. Macroinvertebrate and fish tissues were sampled. Seven of the streams showed indications of herbicides, while six showed insecticides. All levels were under both acute and chronic fresh water quality criteria.

Speaking of fresh fish—few things smell better than a fresh salmon steak on the grill. But salmon don't just smell good, they also smell well—which is to say, they have a keen olfactory sense. In fact, salmon rely heavily on olfactory (smell) clues for key behaviors including homing, breeding, and defense. So explained Dr. Nathaniel Scholz, a research zoologist at the National Oceanic and Atmospheric Administration/ National Marine Fisheries Service (NOAA/NMFS) Northwest Fisheries Science Center. Neurotoxic pesticides including diazinon have been linked to loss of nervous system function. Research to determine

...continued on next page

Issues Conference Packs 'Em In, cont.

Sally O'Neal Coates, *Agrichemical & Environmental News* Editor

levels of effect is ongoing; initial experiments seem to show the potential for effect at environmental concentrations.

Risk Assessment Defined

The morning's final presentations focused on risk assessment. Dr. John Stark of WSU's Department of Entomology provided an overview of the topic, and Dr. Allan Felsot returned to the podium to discuss probabilistic risk assessment. Echoing Dr. Felsot's comments from earlier in the day, Dr. Stark reminded us that risk assessment isn't wholly science—it's also interpretation, judgement, probability. Steps leading up to risk assessment include (1) hazard identification, (2) dose-response assessment, and (3) exposure assessment. These are followed by the characterization or assessment of risk. This can be achieved deterministically via a simple quotient, dividing the estimated environmental concentration by the toxicological endpoint concentration, or by probabilistic methods. Deterministic risk assessment is based on a single exposure estimate, usually a worst-case scenario, and tends to result in very conservative results. Probabilistic methods allow for factoring more realistic variables into assessment equations.

The Urban Perspective

The post-lunch panel presentation focused on pesticide impacts in urban environments. David Galvin, Hazardous Waste Management Program Manager for King County, pointed out that (1) more varieties of pesticides are applied in urban areas, (2) more pounds of pesticide are applied per acre in urban areas, and (3) some pesticides found in urban streams exceed aquatic life concentration limits. He shared recent developments, issues, and accomplishments of the city, county, and tri-county (King, Pierce, Snohomish counties) area, including the October 6, 1999, announcement by King County and the City of Seattle of a comprehensive plan to (1) phase out use of certain pesticides by June 2000, (2) reduce total volume of pesticides used in Seattle by thirty percent, and (3) adopt a county Integrated Pest Management (IPM) policy.

Peter Dervin, Executive Director of the Washington Association of Landscape Professionals (WALP), continued the urban discussion. He admitted that landscape contractors have historically been reactive rather than proactive about regulations, waste, and runoff issues. Governmental regulations have hurt his industry and angered many landscape professionals. Now, WALP is working to mend fences and change attitudes, in part by adding the option of an Environmental Advanced Endorsement to its Certified Landscape Technician (CLT) program.

Conference Chair Carol Ramsay wrapped up the urban segment by stating and amplifying WSU Pesticide Education Program's goal: risk mitigation through education. As Pesticide Education Coordinator, Ramsay oversees diverse education projects including the Master Gardener program, the Hortsense website, the Urban IPM and Pesticide Safety Education Project, and the Pesticide Applicator (pre-license and recertification) Training programs.

The Many Facets of Buffer Zones

Buffer zones were the topic for the next panel. Lee Faulconer from Washington State Department of Agriculture (WSDA) began by emphasizing that "providing functional riparian habitat is probably the single most important thing…in helping recover listed salmon." Buffer zones—admittedly political in nature and ill-defined—are part of that riparian strategy. He described two buffer models, one developed for forest lands and one for the Conservation Reserve Enhancement Program, and discussed the processes underway for further defining buffers.

Lisa Lantz, Executive Director of Washington State Noxious Weed Control Board, explained that persistent, non-native weeds can foul riparian habitat by impeding water flow, competing for nutrients, and altering habitat physiology. Pesticide use can be reduced by detecting weeds early, preventing seed production, and employing non-chemical controls.

Establishment of appropriate buffer plants was addressed by The Nature Conservancy's Jonathan

...continued on next page

Issues Conference Packs 'Em In, cont.

Sally O'Neal Coates, *Agrichemical & Environmental News* Editor

Merz. The seemingly simple concept of re-establishing native plants proved complex in The Nature Conservancy's initial eastern Washington efforts. Seed origin, soil quality, weeds, establishment time, and timing of plantings each presented challenges. Over time, his organization has developed working methods and models for native plantings in this part of the state.

Finally, Dr. Doug Walsh, WSU Agrichemical and Environmental Education Specialist, discussed potential buffer zone impacts on arthropods, both pest and beneficial (see related article in November *AENews*, Issue No. 163, pp. 9–13.) He concluded that pest insects may well proliferate in buffer zones, but beneficials are equally likely to establish and thrive.

Watch for the 5th Pesticide Issues Conference, to be held fall of 2000.

ESA Section VII: Everybody Hold Hands and Hum Along, Now

The final panel addressed Section VII of the Endangered Species Act (ESA), specifically, the mechanism of interagency cooperation known as "consultation" (full text of the U.S. code describing this process can be viewed at **http://www4.law.cornell.edu/uscode/16/1536.html**). Consultation is designed as a structured process through which federal agencies confer and cooperate to further ESA objectives. Jodi Bush of the United States Fish and Wildlife Service (USFWS) gave some general background on the Endangered Species Act, and an overview. She outlined the act's various sections, emphasizing Section VII. Jake MacKenzie, representing the EPA, acknowledged that the consultation process is frequently acrimonious and always time-consuming, but is effective. Lee Faulconer returned to the podium to present WSDA's perspective. He expressed concerns about an upcoming consultation involving the U.S. Fish and Wildlife Service and National Marine Fisheries Service that may not ***include*** WSDA, but will definitely ***affect*** WSDA. A spirited question-and-answer session followed, centering around various private parties' and non-federal agencies' concerns about not being involved in ESA consultation processes that directly affect them.

Along these lines, the day's final speaker, WSDA's Joel Kangiser, addressed some challenges with state involvement in ESA-related consultations. Specifically, EPA's requirement that WSDA consult with USFWS or NMFS prior to issuing Section 18 exemptions and Section 24(c) (Special Local Needs or "SLN") registrations is problematic, especially in the case of time-sensitive Section 18s. WSDA has developed a matrix of default restrictions that take into account commonalities among various ground, airblast, chemigation, and aerial application techniques at several levels of pesticide toxicity. Such a matrix, suggests WSDA, could be essentially pre-approved, eliminating the need for an after-the-fact consultation during the urgent process of approving an emergency exemption or special needs registration. WSDA has submitted a "Memorandum of Understanding" regarding this proposed process to USFWS, and plans to do something similar with NMFS.

Without benefit of gong or crook, Carol Ramsay brought the information-packed day to a close promptly at 4:00. Conference proceedings may be purchased for $10 by contacting Carol at **ramsay@wsu.edu**. Those interested in serving on the planning committee for the 5th Pacific Northwest Pesticide Issues Conference, likely to be held in October 2000, should also contact Carol at that address or (509) 335-9222. Watch for news about next fall's conference in this newsletter and on the Pesticide Education Program's website at **http://pep.wsu.edu**.

*Sally O'Neal Coates is an Editor of Research Publications for WSU. She is Editor of this newsletter, and can be reached at **scoates@tricity.wsu.edu** or (509) 372-7378.*

Biological Control of Yellow Starthistle with Introduced Insects

Page 11
Agrichemical & Environmental News
Dec. 1999
No. 164

Dr. Gary L. Piper, Entomologist, WSU

Most people have no use for weeds. Weeds interfere with our use of land and water resources, they compete with desired crop and non-crop plants, and they harm our livestock (or even us, upon occasion). Weed scientists and researchers are continually searching for the most efficient and economical, and the least environmentally disruptive, methods to reduce losses caused by weeds. During the latter part of the twentieth century, great progress has been made in dealing with weed problems more consistently and efficiently. However, these intrusive plants still result in serious economic losses and demand our continued attention and financial resources.

Various combinations of preventive, physical, cultural, chemical, and biological methods are used to suppress weed populations. Biological control is the planned use of living organisms such as insects, mites, vertebrate animals, and plant pathogens to reduce the vigor, reproductive capacity, density, or effect of undesirable plants. Most biological weed control projects target non-native plant species. A substantial percentage of the noxious weeds in Washington have been accidentally (or, in some cases, intentionally) introduced from Europe and Asia. These unwanted plant colonists were not accompanied by the biotic organisms that typically kept their populations under control in their native homelands. As a result, such weeds have spread throughout western North America.

The outlook for biological control of yellow starthistle is excellent...

The biological control practitioner attempts to reduce the abundance of undesirable plants by increasing the number of weed predators. To biologically control a weed, destructive biotic organisms must be obtained from the weed's native range and subjected to an extensive overseas and domestic testing program lasting from three to five years. This ensures that the organisms damage only the targeted weed or its weedy relatives and will not be injurious to non-target vegetation. If judged safe by federal and state regulatory agencies, the bioagents are then introduced into the field. Ideally, the biocontrol agents eventually become abundant and reduce the severity of the weed problem.

Yellow Starthistle is Ripe for Biocontrol

Yellow starthistle *(Centaurea solstitialis),* also known as St. Barnaby's thistle and golden thistle, is an Eurasian weed that is believed to have been introduced into Washington as an alfalfa seed contaminant. The weed presently infests an estimated 150,000 acres of semiarid rangeland, pasture, cropland, transportation rights-of-way, and wasteland in the state. More than 90% of this acreage is located in Asotin, Columbia, Garfield, Walla Walla, and Whitman counties. The plant is highly invasive in disturbed soil sites and is still expanding its naturalized range.

In rangeland areas, yellow starthistle is very competitive. The dense canopy formed by a monoculture of the weed blocks light penetration to the soil surface and effectively eliminates the emergence or growth of competing, edible forage species, reduces grazing capacity, and diminishes native plant species diversity. The long, sharp spines of the flower heads may physically injure browsing animals and deter human access to heavily infested recreational or other lands. If ingested by horses, the plant can cause a chronic and potentially fatal neurological disorder called "chewing disease" or equine nigropallidal encephalomalacia. The dried plant skeletons can also provide fuel for late summer fires.

Yellow starthistle normally behaves as a winter annual. Depending upon moisture availability, seeds germinate in the fall or spring and develop rosettes which eventually produce the flowering shoots during late May and June. Mature plants are highly branched and bear solitary flower heads at the branch ends. Flowers are bright yellow and the middle and lower

...continued on next page

Biocontrol of Yellow Starthistle, cont.

Dr. Gary L. Piper, Entomologist, WSU

floral bracts are armed with spines. Since yellow starthistle is an annual, its only method of year-to-year survival is through the production of seeds. Several thousand seeds may be produced by a plant under optimal conditions. Seeds are both plumed and plumeless; plumed seeds are spread short distances by the wind whereas plumeless seeds fall to the soil beneath the parent plant to reinfest the site. Nearly all seed is viable at maturity, but about 10% of the seed may remain dormant in the soil for up to 10 years.

Effective management of existing infestations must involve a systematic and persistent application of multiple methods over several years. The management approach will vary according to the extent and density of the infestation, the terrain, the equipment available, the budget, and the planned use for the site. Yellow starthistle suppression methods include cultivation, mowing, burning, grazing management, encouraging or reseeding desirable perennial replacement plant species, treating with herbicides, and use of biological control organisms.

Six distinct insect species—three flies and three beetles—have proven effective against this highly invasive weed.

Bioagent Specifics

Biological control of yellow starthistle in Washington was begun in 1985 when the beetle *Bangasternus orientalis* from Greece was introduced. Adults are found on the budding plants in early summer and mated females affix individual eggs to leafy bracts beneath the immature flower heads. A female can produce over 400 eggs during a three-month period. Upon hatching, the larva enters and mines through the bracts, mines up the stem, and penetrates the basal portion of the flower head. One or more larvae can develop within a head and each larva can consume and/or damage 40 to 60% of the seeds. Once feeding has been completed, the larva pupates within a cell it constructs within the injured head. Newly formed adults escape from the heads in late summer and seek protected overwintering sites. There is but one generation annually. This insect has been released and become established in all yellow starthistle-infested counties.

A second bioagent released in 1985 was the fly *Urophora sirunaseva.* This insect completes two generations a year. First-generation adults appear during May and early June; second-generation individuals emerge in early July. Females deposit one or more eggs amongst the partially exposed florets of a bud. Larvae (maggots) burrow through the florets and feed upon immature seeds. In response to *U. sirunaseva* presence, the plant produces tissue which surrounds each larva to form a gall. Flower heads containing multiple galls yield only about 50% of their potential seed crop. Second-generation larvae overwinter within the galls in the seed heads. Pupation occurs during late spring. This fly has been released in several Washington counties but, for unknown reasons, has not developed large populations.

A third insect, *Chaetorellia australis,* was released in 1989. This fly has three generations a year, with adults of the first generation usually infesting cornflower, a yellow starthistle relative, and adults of the other generations attacking both cornflower and yellow starthistle. Females deposit their eggs beneath the bracts of the flower heads, laying only one egg per head. The larva tunnels through the bracts into the head where it feeds upon the soft, developing seeds, usually destroying the majority of them. Up to 10% of the yellow starthistle seed heads throughout a site can be infested by this insect. Pupation occurs within the damaged head. Third generation larvae overwinter within the old seed heads. This fly initially was released in Walla Walla and Whitman counties but it rapidly spread to other southeastern Washington counties.

A fourth insect species, *Chaetorellia succinea,* has recently been found attacking yellow starthistle. A

...continued on next page

Biocontrol of Yellow Starthistle, cont.

Dr. Gary L. Piper, Entomologist, WSU

shipment of *Chaetorellia* from Greece containing *C. australis* and *C. succinea,* which very closely resembles *C. australis,* was released in southern Oregon. *C. succinea* readily established and has quickly spread to infest yellow starthistle in other western states, including Washington. This fly's biology is similar to that of *C. australis* except that it does not attack cornflower. Larvae of *C. succinea* destroy all the developing seeds in a yellow starthistle flower head. This accidentally introduced fly will be a very important biocontrol agent.

A fifth insect, *Eustenopus villosus,* was first released in 1990. Adults of this beetle are found on the weed during late June and July where they feed upon and destroy many (75+%) small buds prior to seed formation. Mated females lay eggs in medium-sized, unopened buds during July. Upon hatching, the larva feeds on the developing seeds, consuming 90 to 100% of them over a sixteen-day period. Pupation occurs in a chamber constructed from chewed seeds and pappus hairs within the damaged head. Adults exit the heads in late summer, disperse, and overwinter amongst soil debris. There is but one generation a year. *Eustenopus villosus* is undeniably the most effective insect released against yellow starthistle thus far and is responsible for noticeably reducing the overall density of the weed—by as much as 70% in areas where it is well established. It has been redistributed to every yellow starthistle-plagued county in Washington.

A sixth species, the beetle *Larinus curtus,* was initially released in 1992. Adults are active during late June and July and can be observed feeding upon yellow starthistle flowers and pollen. Eggs are laid between the flowers of a partially opened head and up to three larvae feed on the ripening seeds over a three-to-four-week period. Seed destruction levels may exceed 96%. Pupation occurs within the damaged heads. Adults escape from the heads in the early fall and seek protected overwintering sites amongst soil surface debris. *Larinus curtus* completes a single generation each year. This control agent is well established in Klickitat County and new releases are being made in other counties to enhance the beetle's distribution.

The outlook for the biological control of yellow starthistle in Washington and other areas of the western United States appears to be excellent. The successful use of insect biological control agents will lessen the weed's invasiveness and abundance. Biocontrol represents an effective, low cost, long-term, and ecologically sound form of suppression, especially when it is integrated with other available management methods.

Dr. Gary L. Piper is an Entomologist at Washington State University, Pullman. He can be reached at ***glpiper@wsu.edu*** *or (509) 335-1947.*

AEN Y2K Subscription Reminder

Time is running out to renew your *Agrichemical and Environmental News* subscription for next year. Send your check for $15, made out to WSU, to **Pesticide Information Center, WSU Tri-Cities, 2710 University Drive, Richland WA, 99352-1671, ATTN: Sally O'Neal Coates, Editor**. *Please include full name and address of newsletter recipient.* Should you require an invoice, just let us know by phoning (509) 372-7378. Internet access to *AE News* remains free; the URL is **www2.tricity.wsu.edu/aenews**.

Page 14
Agrichemical & Environmental News
Dec. 1999
No. 164

UW Hosting Course on Pesticide Use, Exposure, and Health Effects

Norm Herdrich, PNASH Outreach Coordinator

Local and national experts on pesticide exposure will speak at a one-day course entitled "Pesticide Medicine" early next year in Yakima.

"Topics covered will be relevant for practicing clinicians and other professionals who interact with people exposed to pesticides," said Dr. Matthew Keifer, co-director of the course.

The University of Washington's Pacific Northwest Agricultural Safety and Health Center (PNASH) is hosting the course, which will be held in the West Ballroom at Cavanaugh's at the Yakima Center on February 11, 2000.

The objectives of the one-day course are to:

- Increase knowledge of pesticide toxicity.
- Review acute and chronic health effects of pesticides.
- Learn about exposure to pesticides.
- Discuss actual poisoning cases in Washington State.
- Understand the workers compensation claims process.

The course is designed for physicians, industrial hygienists, nurses, labor and management representatives, and attorneys, as well as other professionals who deal, either directly or indirectly, with pesticides or the human health effects of pesticides.

The course will be co-chaired by Dr. Lucio Costa, director of the UW's Department of Environmental Health Toxicology Program, and Dr. Matthew Keifer, director of the Occupational Medicine Program at the University of Washington. During the course, Dr. Keifer will give tips to clinicians on how to recognize and treat symptoms of pesticide overexposure. Dr. Allan Felsot, Environmental Toxicologist at Washington State University, will add his unique perspective on the importance of pesticides in relation to human health.

A discussion of pesticide exposure in children will be the focus of a talk by Dr. Richard Fenske, who, along with Dr. Keifer, directs the Pacific Northwest agricultural Safety and Health Center. A special guest speaker from the University of California at Davis, Dr. Michael O'Malley, will share his expertise on pesticides and dermatological conditions.

Speakers representing government agencies include Dr. Jerry Blondell, a health statistician from EPA's Office of Pesticide Programs, who will discuss the epidemiology of pesticide poisoning. Barbara Morrissey, a toxicologist from the Washington Department of Health Pesticide Program, will present case studies from Washington, and Vicky Skeers, an occupational health nurse consultant from the Washington Department of Labor and Industries, will help attendees understand the process of filing a workers compensation claim.

The cost of the course is $165 for those who register before January 14. After that date, the registration fee is $195. To register, call (206) 543-1069, e-mail at **ce@u.washington.edu** or visit our website at **http://depts.washington.edu/envhlth/conted.html**. This Internet site also provides information about other University of Washington courses on occupational and environmental health.

The Pacific Northwest Agricultural Safety and Health Center, funded by NIOSH, is one of eight such centers in the United States. The Center's mandate is to study occupational health and safety issues in farming, forestry and fishing in the four Region X states of Idaho, Washington, Oregon and Alaska. Dr. Richard Fenske is the Center Director, Dr. Matthew Keifer is Co-Director, and Sharon Morris is Associate Director. Adrienne Hidy is the Center's Administrator, and Marcy White is the Program Coordinator.

*This article was prepared by Norm Herdrich, PNASH Outreach Coordinator. To obtain additional information, he can be contacted at (509) 926-1704, or e-mail him at **normh@u.washington.edu**.*

Know Your Enemy

Proper Pest Identification Is Good for the Environment *and* the Bottom Line

Page 15
Agrichemical & Environmental News
Dec. 1999
No. 164

Dr. Richard Zack, Gary Pelter, & Todd Adams, WSU, and Dr. Peter Landolt, USDA

With thousands upon thousands of insect species found in the Northwest, it is amazing how few are actually pests of any significance. In fact, the great majority of insects are either of no concern or are beneficial as pollinators, decomposers, or biological control agents. It is, therefore, very important to be able to recognize pests and differentiate them from non-pests.

By differentiating between the corn earworm and false corn earworm...

The general agricultural community has become very aware of recognizing true pests and applying management (principally chemicals) only when warranted. Not only does this make good sense from an environmental stewardship standpoint, it makes good economic sense. Why pay to control a non-pest or to manage a pest that is not causing enough damage to warrant the costs of control? Pest management, like all other aspects of business, ultimately is a matter of balancing costs and benefits.

...growers saved an estimated $160,000 in the first year.

Sweet corn is grown on almost 100,000 acres in central Washington. The corn earworm, *Helicoverpa zea* (Boddie), is a key pest of sweet corn throughout the United States, including Washington. They deposit their eggs in developing ears. The moth larvae feed upon the ears and foul them with their excrement. If not controlled, this pest can easily destroy a complete crop. Consumers have a low tolerance for insects in food and producers have a low tolerance for corn earworm larvae in their crops. In order to plan management of the pest, populations are monitored through the use of traps baited with a female sex pheromone. This pheromone is attractive to male corn earworm but also attracts males of a close and very similar-appearing relative, the false corn earworm moth *(Heliothis phloxiophaga* Grote & Robinson). False corn earworm larvae feed on a variety of non-agricultural vegetation and are not pests. Unfortunately, because the moths are very similar and the false corn earworm is attracted to the pheromone used in corn earworm traps, the capture of this "wrong" species gives field personnel an inflated impression of the true numbers of corn earworm present and can lead to insecticide applications when none are needed.

In 1998, individuals representing the Columbia Basin sweet corn industry and WSU Cooperative Extension agents Gary Pelter and Erik Sorensen approached Rich Zack about conducting a training session that would help field personnel separate the two moths so that they could make more refined and better decisions concerning management of corn earworm. Although the two species are difficult to separate, we developed an illustrated, one-sheet flyer that pointed out differences and could be carried into the field. Most left the meeting feeling that they could differentiate between the two moths (at least enough to make significant differences in their counts). In a survey taken at the end of the field season by Pelter, most growers reported that they had decreased the number of sprays applied, especially in the early season when false corn earworm is more common, resulting in an estimated $160,000 savings in pesticide applications.

In late 1998, we decided to expand the project and enlisted the aid of Dr. Peter Landolt, a research entomologist at the Yakima United States Department of Agriculture (USDA) entomology lab. Dr. Landolt is a leading scientist in pheromone research and in insect attractants in general. In a cooperative endeavor between WSU, the USDA, and numerous central Washington sweet corn processors (with funding from the processing industry and the EPA) we

...continued on next page

Know Your Enemy, Save Money, cont.

Dr. Richard Zack, Gary Pelter, & Todd Adams, WSU, and Dr. Peter Landolt, USDA

are now looking for a pheromone that will be more specific for true corn earworm and eliminate the need for the identification of trap specimens, which are often in poor shape and difficult to identify. The project has several additional objectives:

- finding a feeding attractant that would lure both male and female moths, making possible predictions of seasonal population growth and damage (only females really need to be controlled and they may have different abundance peaks than males);
- conducting season-long surveys to get a better idea of when the moths actually appear and in what numbers; and,
- testing a number of different trap types so that trap costs can be balanced with effectiveness.

Todd Adams, a WSU graduate student from the Yakima area, is conducting most of the field research. Connie Smithhisler at the USDA lab is providing formulated pheromone blends.

Our preliminary results are promising. We now have a much better understanding of when each species of moth is active and a better understanding of which types of areas are favored by the false corn earworm. We have tested several different trap designs but have yet to evaluate these data. We are currently evaluating the different pheromone formulations and feeding attractants. We hope that within the next few years, the need to differentiate these two moths will be significantly decreased. However, just the fact that field personnel now recognize that two different moths will be taken in their traps and that they have the ability to differentiate between the two, has lead to significant changes in management practices—good environmental stewardship ***and*** saving money!

Dr. Richard S. Zack and Todd Adams are with WSU's Department of Entomology in Pullman. Gary Pelter is with WSU Cooperative Extension of Grant/Adams Counties. Dr. Peter J. Landolt is with the Yakima USDA Entomology Research Division located in Wapato, Washington. Dr. Zack can be contacted at ***zack@mail.wsu.edu*** *or (509) 335-3394.*

PNN Update

Jane M. Thomas, Pesticide Notification Network Coordinator

The Pesticide Notification Network (PNN) is operated by WSU's Pesticide Information Center for the Washington State Commission on Pesticide Registration. The system is designed to distribute pesticide registration and label change information to groups representing Washington's pesticide users.

PNN notifications are available on our web page. To review those sent out in October either access the PNN page via the Pesticide Information Center On-Line (PICOL) Main Page, **http://picol.cahe.wsu.edu/,** or directly, at **http://www.tricity.wsu.edu/~mantone/pl-newpnn.html**.

We hope that this new electronic format will be useful. Please let us know what you think by submitting comments to Jane Thomas at (509) 372-7493 or **jmthomas@tricity.wsu.edu**.

Federal Register Summary

Jane M. Thomas, Pesticide Notification Network Coordinator

In reviewing the October postings in the Federal Register, we found the following items that may be of interest to the readers of *Agrichemical and Environmental News*.

In the October 6 Federal Register, EPA announced that the revised risk assessments for naled and temephos were available for review and comment. These documents can be accessed through URL: **http://www.epa.gov/pesticides/op/status.htm**. Comments must be submitted to EPA on or before December 6, 1999. (Page 54298)

In the October 6 Federal Register, EPA announced that the preliminary human health risk assessments and related documents for chlorpyrifos methyl are available for review and comment. These documents are avialble on-line at the following URL: **http://www.epa.gov/oppsrrd1/op/chlorpyrifos-methyl.htm**. Comments must be submitted to EPA on or before December 6, 1999.(Page 54296)

EPA Information is available on-line at: http://www.epa.gov

In the October 14 Federal Register, EPA announced that the revised risk assessments for fenthion were available for review and comment. These documents are available electronically at the following URL: **http://www.epa.gov/oppsrrd1/op/fenthion.htm**. Comments on these documents should be submitted to EPA by December 13, 1999. (Page 55712)

In the October 15 Federal Register, EPA established an exemption from the requirement of a tolerance for residues of Rhizobium inoculants (pure strains of Rhizobium spp. bacteria [e.g. Sinorhizobium, Bradyrhizobium & Rhizobium]) when used as inert ingredients in pesticide formulations applied to all leguminous food commodities. (Page 55838)

In 1994, EPA issued a proposed rule on container design and residue removal requirements for refillable and nonrefillable pesticide containers and standards for pesticide containment structures. (59 FR 6712, Feb. 11, 1994). In the October 21 Federal Register, EPA announced that it is reopening the comment period to obtain public comment on three specific issues. EPA is considering changes that would reduce the scope of the container standards, add an exemption for certain antimicrobial pesticides, and adopt some of the Department of Transportation (DOT) hazardous materials regulations. EPA is also seeking comment on the definition for small business used to identify small pesticide formulators, agrichemical dealers, and commercial pesticide applicators in the small entity impact analysis. EPA believes that these potential changes would support pollution prevention by promoting the use of refillable containers and that they would decrease the estimated economic impact of the proposed rules by reducing the number of pesticide products subject to the container requirements. Comments on these issues should be submitted to EPA on or before December 20, 1999. (Page 56917)

In the October 27 Federal Register, EPA announced that a revised version of the pesticide science policy document entitled "Threshold of Regulation (TOR) Policy--Deciding Whether a Pesticide With a Food Use Pattern Requires a Tolerance" is availble. An electronic copy of this document can be accessed via EPA's OPP Science Policy Web Page on **http://www.epa.gov/pesticides/trac/science/**. (Page 57881)

In the October 27 Federal Register, EPA announced that the preliminary human health and ecological risk assessments and related documents for chlorpyrifos are avilable for review and comment. Electronically these documents can be accessed on: **http://www.epa.gov/pesticides/op/chlorpyrifos.htm**. Comments must be submitted on or before December 27, 1999. (Page 57876)

Tolerance Information

Jane M. Thomas, Pesticide Notification Network Coordinator

Tolerance Information						
Chemical (type)	Federal Register	Tolerance (ppm)	Commodity (raw)	Time-Limited		
				Yes/No	New/Extension	Expiration Date
imazapic-ammonium (herbicide)	10/6/99 page 54218	30.00	grass forage	Yes	New	31-Jan-01
		15.00	grass hay			
		0.10	milk			
		0.10	fat, meat, mbp of cattle, goats, hogs, horses, and sheep			
		1.00	kidney of cattle, goats, hogs, horses, and sheep			
			compound to control leafy spurge on pastures, rangeland, and CRP lands.			
tebuconazole (fungicide)	10/8/99 page 54777	0.40	sunflower oil	Yes	Extension	31-Jan-00
		0.20	sunflower seed			
			tebuconazole to control sunflower rust in sunflowers grown in the plains states.			
ethalfluralin (herbicide)	10/8/99 page 54779	0.05	canola	Yes	Extension	31-Jan-01
			of ethelfluralin to control kochia in canola.			
tebufenozide (insecticide)	10/21/99 page 56690	0.10	legume vegetable foliage	Yes	New	30-Sep-03
		0.50	forage, fodder, hay, and straw of cereal grains			
		0.50	grass forage, fodder, and hay			
		0.50	forage, fodder, hay, and straw of non-grass animal feed			
			tebufenozide.			
sethoxydim (herbicide)	10/21/99 page 56697	10.00	buckwheat	Yes	New	31-Dec-01
			volunteer grains, foxtail, and quackgrass in North Dakota buckwheat.			
metolochlor (herbicide)	10/21/99 page 56678	0.30	spinach	Yes	Extension	31-Dec-01
		10.00	grass forage			
		0.20	grass hay			
			of metolachlor on spinach and grass grown for seed			
pyriproxyfen (insecticide)	10/21/99 page 56681	0.02	tree nuts	No	N/A	N/A
		0.02	fruiting vegetables except cucurbits			